

## 2.0 Purpose & Need for Agency Action

### 2.1 Purpose and Need for Agency Action

From 1952 to 1991, DOE and its predecessor agencies reprocessed spent nuclear reactor fuel at the Idaho Chemical Processing Plant, located on the Snake River Plain in the desert of southeast Idaho. This facility, now known as the Idaho Nuclear Technology and Engineering Center (INTEC), is part of the Idaho National Engineering and Environmental Laboratory (INEEL), a nuclear research complex that has served both peaceful and defense related missions for the nation.

Processing operations at INTEC utilized solvent extraction systems to extract uranium-235 and other defense-related materials from spent nuclear reactor fuel and, in the process, generated HLW as well as other wastes. HLW is a product of the first extraction cycle of the reprocessing operation. Subsequent extraction cycles, follow-up decontamination activities, and liquids from HLW treatment activities produced additional liquid waste, less radioactive than HLW, and best characterized as mixed transuranic waste. Since the decontamination solutions contained high levels of sodium, this liquid waste is referred to as mixed transuranic waste/sodium bearing waste (SBW). At INTEC, all of these liquid wastes were stored in eleven 300,000-gallon underground tanks. Over several years, much of the liquid waste was fed to a treatment facility and converted to a dry granular substance called calcine. The calcine, which is stored in large, robust bin sets, is a more stable waste form, posing less environmental risk than storing liquid radioactive waste in underground tanks. However, the calcine would not meet current waste acceptance criteria for disposal in a geologic repository and further treatment would be necessary to convert the HLW into a waste form acceptable for disposal in the geologic repository.

In 1998, DOE completed calcining all remaining liquid HLW. At present, approximately 4,200 cubic meters of HLW calcine is stored in INTEC bin sets and the remaining 1.4 million gallons left in the underground tanks are considered to be mixed transuranic waste.

## **2.2 Timing and Regulatory Considerations Important and Relevant to Purpose and Need**

Since the 300,000-gallon underground storage tanks at INTEC were not built to current hazardous waste management standards, it is DOE's objective to empty them and initiate tank closure in compliance with applicable regulations. DOE intended to empty the tanks by calcining all of the liquid waste. This course of action was selected in a 1995 Record of Decision as the

### ***History of High-Level Waste***

*In a 1969 staff paper published by the Atomic Energy Commission ("Siting of Commercial Fuel Reprocessing Plants and Related Waste Management Facilities"), high-level liquid wastes were described as "those, which by virtue of their radionuclide concentration, half-life, and biological significance, require perpetual isolation from the biosphere, even after solidification."*

*It was anticipated that the only liquid source of waste meeting these criteria would be the liquid generated during the first cycle of a process that extracted key radionuclides from dissolved irradiated nuclear reactor fuel. Liquid wastes from subsequent extraction cycles typically did not contain radionuclides at levels that warranted permanent isolation. However, these wastes could be considered HLW if concentrated to the point where radionuclide concentrations and half-lives would pose a significant long-term risk to the biosphere. The Nuclear Waste Policy Act of 1982, as amended, determined that a geological repository would be used for providing the necessary permanent isolation.*

appropriate treatment (60 FR 28680; June 1, 1995). Further, commitments regarding when the liquid waste would be calcined were made to the State in the 1995 Idaho Settlement Agreement/Consent Order (USDC 1995) and subsequently included in the Site Treatment Plan Consent Order. Since 1995, new regulatory considerations have necessitated another review of treatment options.

Some of these considerations include technical constraints, which have hindered DOE's efforts to sample offgas emissions from the New Waste Calcining Facility calciner, as well as logistical

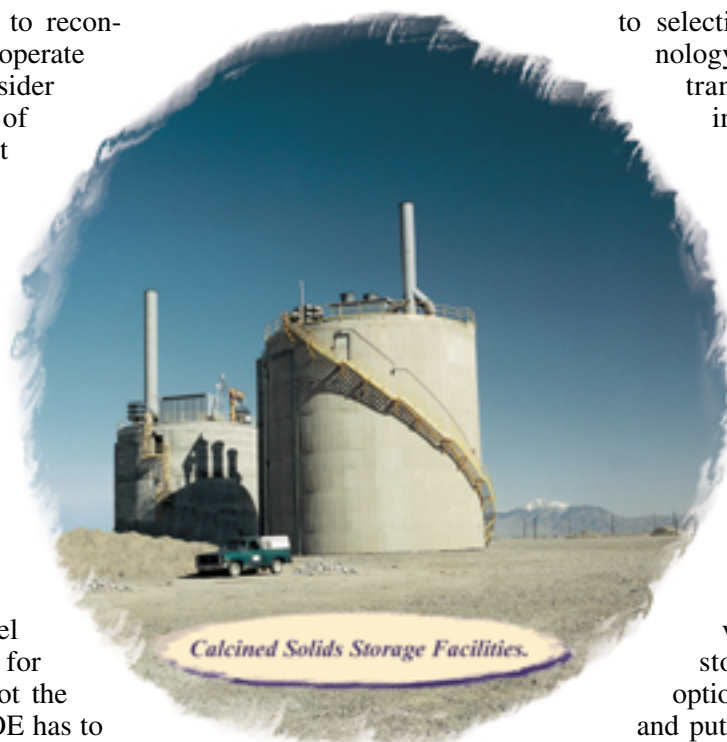
problems associated with obtaining representative constituent samples from the large volumes of mixed transuranic waste/SBW stored in the tanks. Emission and waste characteristic data is needed to support a RCRA permit application, which DOE must submit to the State of Idaho in order to continue running the calciner. If such a permit has not been obtained by June 1, 2000, the State has ordered DOE to cease calciner operations until such a permit is granted (Kelly 1999).

In addition to the RCRA permit, EPA has new air quality standards for hazardous waste combustion units. These standards must be met to allow continued operation of the calciner after 2002. Physical upgrades to the calciner and collection of additional data would be required in order to comply with these new standards, at considerable expense. For these reasons, DOE needs to reconsider its decision to operate the calciner and consider the relative merits of other alternatives that would empty the tanks of liquid mixed transuranic waste/SBW and meet time commitments to the State of Idaho.

Getting the liquid mixed transuranic waste/SBW out of the underground tanks by 2003 for the five pillar and panel vault tanks and 2012 for remaining tanks is not the only commitment DOE has to the State of Idaho. DOE is also committed to treating the calcine so that it can be put in a form that can be transported out of Idaho to a disposal or storage facility by a target date of December 31, 2035 (USDC 1995). In a 1995 Record of Decision, DOE selected a treatment technology (radionuclide partitioning) to be tested for potential use. If testing proved successful, DOE would move forward and prepare a site-specific National Environmental Policy Act analysis, comparing

the potential environmental impacts of a radionuclide partitioning facility to other available treatment alternatives. DOE needs to prepare this analysis now since there is a requirement in the Settlement Agreement/Consent Order that directs DOE and the State of Idaho to start negotiations regarding the plan and schedule for treatment of the calcined waste by December 31, 1999. For both parties to participate in meaningful discussions on this subject, both partners need to understand the available alternatives and their potential impacts. Further, in order for DOE to act on the outcome of these negotiations, a Record of Decision must be issued based on an EIS.

As required under the National Environmental Policy Act, an EIS must analyze environmental impacts associated with related project actions. In this case, actions related to selecting a treatment technology for HLW and mixed transuranic waste/SBW include storage and disposal alternatives associated with the various waste streams from these processes as well as disposition of the facilities once the job is complete. This analysis is necessary so that an assessment of cumulative impacts associated with the various treatment, storage, and disposal options can be presented and put into perspective with other activities that may affect the environment. At INTEC, for example, a remedial investigation and feasibility study and consequent CERCLA Record of Decision (DOE 1999) has resulted in the selection of remedial actions for areas of historical contamination. One of the criteria used to select a remediation alternative is the calculated risk to human health and the environment. However, these risk calculations do not factor in any additional risks posed by the treatment, storage, and disposal options



*Calcined Solids Storage Facilities.*



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that DOE needs to identify for HLW and mixed transuranic waste/SBW.

DOE needs to move forward and identify potential risks to human health and the environment from the various HLW and mixed transuranic waste (SBW and newly generated liquid waste) management options. This is necessary because cleanup remedial actions selected under the Record of Decision for the Operable Unit 3-13 portion of Waste Area Group 3 and the ongoing CERCLA evaluations for the remainder of Waste Area Group 3 may affect waste processing and facility disposition options at INTEC. A timely EIS that integrates environmental impacts identified through the CERCLA cleanup process with those identified for HLW and mixed transuranic waste/SBW management options is essential for informed decision making. CERCLA evaluations are required to incorporate National Environmental Policy Act values under DOE policy but are not subject to the Act. This EIS evaluates the cumulative impacts of CERCLA actions as well as alternatives for the management of HLW and mixed transuranic waste/SBW.

In addition to the reasons discussed above, the following factors are relevant to the timing for this EIS. First, it is not too soon for DOE to begin an environmental analysis of technologies that would begin operation by 2007. The alternative treatment technologies evaluated in this EIS will require lead time for conceptual design and engineering. Adding these years to a schedule for construction and the operational lifetime of a selected technology leaves DOE little flexibility in meeting commitments set forth in the Settlement Agreement/Consent Order. Second, this EIS is being prepared at a time when there is considerable funding uncertainty. By evaluating innovative alternative scenarios and technologies, DOE is maximizing its scope of possibilities, and by so doing will be better prepared to deal with future resource constraints without compromising commitments to the State of Idaho.

The necessary lead time for facility development and funding of alternative technologies accelerates previous estimates of time when a DOE Record of Decision would be needed to select a calcine treatment technology. When the Settlement Agreement was being negotiated in 1995, it was assumed that the calciner would continue operation until 2012, and issuing a Record of Decision on a technology for treating the calcine could occur as late as December 31, 2009, without jeopardizing the target date of December 31, 2035 for having all the waste treated and ready to leave Idaho. However, after the Settlement Agreement/Consent Order was signed, it was determined that there are alternative technologies that would not involve calcining waste prior to further treatment. Initial engineering analyses of such alternatives, with associated schedules taking into account the time required for design and funding acquisition, revealed that if DOE wanted to select one of these technologies, decisions would have to be made as early as the year 2000. Thus, the timing of this EIS will enable DOE to meet the Consent Order and the Record of Decision milestone contained in the Settlement Agreement far in advance of what was initially considered necessary, but to do otherwise would make it difficult, to meet the target date of December 31, 2035 milestone for getting the waste ready to leave Idaho.

## **2.3 Role of this EIS in the Decision-Making Process**

Chapter 3 of this EIS describes the range of reasonable alternatives to satisfy the purpose and need. Currently, neither DOE nor the State of Idaho (acting as a cooperating agency) has identified a preferred alternative. Based on information presented in this draft EIS and other considerations such as public comment, DOE and the State of Idaho will enter into discussions

about which alternative would be preferable. To achieve mutual objectives, the alternative selected may be a hybrid of the alternatives presented in the draft EIS. If agreement on a preferred alternative can be reached, then the final EIS will be issued stating the selection. If agreement is not reached, then the final EIS will be issued setting forth the State's and DOE's preference.

In accordance with the Settlement Agreement/Consent Order, DOE must begin negotiations with the State of Idaho by December 31, 1999 regarding the plan and schedule for treatment of the calcined waste. This EIS provides a basis for negotiations since the process of trying to reach consensus on a preferred alternative will necessitate discussions about relevant plans and schedules. Further, if on the basis of this EIS, DOE wants to propose modifications to the Settlement Agreement/Consent Order, the information in this document and the cooperative process used to ensure its adequacy will benefit related discussions between the State and DOE.

Based on this EIS and other applicable information, DOE expects to make the following decisions:

- How to treat INTEC mixed HLW so that it can be transported out of Idaho to a storage facility or repository.
- How to treat and where to dispose of other radioactive wastes that are associated with the HLW management program at INTEC.
- How to manage treated INTEC wastes that are ready to be transported out of Idaho.
- How to close HLW-related facilities at INTEC, including certain liquid waste storage tanks, bin sets, the New Waste Calcining Facility, facilities that would be constructed under the waste processing alternatives and treatment options, and associated laboratories and support facilities.